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DEPARTMENT OF THE ARMY
ASSISTANT SECRETARY OF THE ARMY
RESEARCH, DEVELOPMENT, AND ACQUISITION
WASHINGTON, D. C. 20310



**A R M Y
S C I E N C E
B O A R D**

REPORT OF PANEL
ON
EMERGING HUMAN TECHNOLOGIES

December, 1983

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To do so, the Army needs to organize and integrate the process of exploring, evaluating, testing and adapting such technologies.

Finally, exercise caution in these efforts remembering to allow room for freshness and innovation while simultaneously maintaining a solid scientific footing for introduction of the results of the RDT&E programs.

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FOREWORD

This report is the completed review of the findings and conclusions of the recent investigation carried out within the Human Resources and Capabilities Functional Subgroup.

The operational definition of "human technology" for this investigation is "strategies and actions which improve human capability, potential and/or performance".

The tasking of the panel was to determine the advisability of the Army's mounting a significant effort to assess, learn how to exploit and then implement such technologies into day-to-day Army operations.

The recommendations of this report are based upon review of selected emerging human technologies and are not founded upon a complete evaluation of the many projects, efforts and innovations going on in the Army, industry, academic institutions, sister services, or other agencies.

HUMAN CAPABILITIES AND RESOURCES FUNCTIONAL SUBGROUP INVESTIGATION
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INVITED PRESENTERS

Cohesion Technology
Concentrix
Hemi-Synch
High Performance Programming
SALTT

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TASKING LETTER

The Ad Hoc Study Group was assembled to provide psychological, medical and military operations perspectives to the review. It carried out the study consistent with tasking letter attached.



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310

2 NOV 1983

Dr. Wilson K. Talley
One Clipper Hill
Oakland, California 94618

Dear Dr. Talley:

I request that you appoint an Army Science Board panel to review the findings and conclusions of the investigation of emerging human technologies carried out within the Human Resources and Capabilities Functional Subgroup.

The operational definition of "human technology" for this study is that of strategies and actions which improve human capacity, potential and/or performance.

The issues to be addressed by this review are as follows:

- a. Are there selected concepts or approaches as examples of emerging human technologies that may be of benefit in training or enhancing performance?
- b. Do any of these applications have potential near midterm battlefield application?
- c. Are such technologies "packageable" for ready field use?
- d. Can they be used to foster excellence, innovation and creativity?
- e. Are there ways to better utilize the potential of soldiers through the application of such technologies?
- f. Can these techniques materially add to the leadership quality and the tone of Army organizations?

LTG Elton, DCSPER, is the sponsor, MG Mitchell is the Senior Advisor, LTC Winn McDougall, Soldier Support Center, phone number (202) 325-0393, is the DA Staff Assistant. My Cognizant Deputy is Dr. Gordon Prather, at phone number (202) 695-7674.

Request the panel begin work immediately and forward a letter report of their findings by December 1983.

Sincerely,

Amoretta M. Hoeber
Principal Deputy Assistant Secretary of the Army
(Research, Development and Acquisition)

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Army Science Board Panel

To Review

Emerging Human Technologies Report

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ISSUES EXAMINED AND FINDINGS

The Terms of Reference for this Ad Hoc Study Group raised six issues to be investigated as outlined in the Tasking Letter.

The findings of the study group are as follows:

- Issue a:** There are concepts and approaches imbedded within the various "emerging human technologies" that have direct application to Army training and performance requirements
- Issue b:** Some of these applications appear to have beneficial near-term payoff as well as mid-term utility
- Issue c:** Some emerging technologies are highly packageable for field use; others require considerable expertise and are not currently developed to a stage of easy exportability
- Issue d:** Innovative human processes, as exemplified in some emerging human technologies, can provide pathways to increasing excellence
- Issue e:** Much work needs to be done to document the short-term and long-term benefits of such technologies
- Issue f:** Well designed cross-sectional and longitudinal studies are required to validate results of these approaches

FOCUS FOR THE STUDY GROUP

The Ad Hoc Study Group was formed in response to a request by (then) LTG Thurman, DA DCSPER, to explore "emerging concepts in human technology" and civilian and military applications and potentials for their use in an Army of excellence (Appendix A).

To support this study, a series of meetings were held and a workshop conducted with support provided by the US Army Soldier Support Center-NCR, the DA DCSPER and the Intelligence and Security Command. The schedule of meetings may be found in Appendix B.

As a result of these meetings, five "emerging technologies" were selected as representative of broad and of narrow scope methodologies that could have possible practical application to TO&E and TDA organizations.

The technologies selected were directed toward improving individual, team and unit effectiveness through:

- * processes that create and maintain a deep sense of belonging,
- * mutual goals, support and cohesion through integration of physical, psychological and values-based behavior components
- * training aimed at increasing a soldier's acquiring, improving and sustaining individual eye-hand coordination, balance, body control, sensory skills and visualization skills
- * defining models for leaders to follow in moving their organizations along a programmable pathway from mere reactivity to self-sustaining, innovative individual and group high performance
- * application of audio tapes which align brain wave synchronization to focus and enhance brain functioning and to produce specific biological responses
- * use of a combination of physical relaxation exercises, concentration techniques, guided imagery and suggestive principles to accelerate initial learning and heighten retention

A brief discussion/evaluation by panel members of each of these individual technologies and a short description of each technology by its proponent may be found at Appendices C through G.

CONCLUSIONS ON TECHNOLOGIES REVIEWED BY AD HOC STUDY GROUP

COHESION TECHNOLOGY - Evaluate results from current test beds for possible broader application to a variety of organizations, for support of COHORT and the New Manning System, and for rapid battlefield reconstitution

CONCENTRIX - Continue ongoing TRADOC Test and Evaluation
Broaden application, if warranted by above evaluation

HIGH PERFORMANCE PROGRAMMING - Continue evaluation for potential application to leader development

Separate New Patterns of Influence from High Performance Programming and scientifically verify that New Patterns of Influence are valid

HEMI-SYNCH - A number of unanswered questions remain that require scientifically validated results

SUGGESTIVE ACCELERATED LEARNING AND TEACHING TECHNIQUES - Complete currently scheduled language training test and evaluation effort

Do not invest further Army resources until significant adaptation for successful and economically feasible Army use can be demonstrated

Continue to monitor developments in commercial applications

RECOMMENDATIONS

KEY PRIORITY RECOMMENDATIONS

1. Emphasize a holistic approach which considers and intermeshes physical, psychological and attitudinal dimensions in using and managing the Army's human assets.
2. Establish additional test beds for application of selected human technologies and document results through sound scientific research design.
3. Develop empirical data to show how emerging human technologies can be useful to the Army.
Areas of major emphasis could include technologies which can improve individual/crew/unit performance, leadership, learning and training, motivation and cohesion, soldier-machine interface and productivity/readiness of the Army's human assets.
4. Create a scanning mechanism to keep abreast of current developments across the broad spectrum of emerging human technologies.
This integration accountability should be placed within the mission of the DCSPER.
5. Consider empaneling a follow-on Army Science Board Ad Hoc Study Group to investigate approaches to:
 - establishing priorities for areas of inquiry
 - providing for a scientifically-based audience for assessment of efforts pursued by the Army
 - determining how those elements of the Army accountable for human performance can perform human technology R&D more cohesively to meet Army requirements
6. Document the physical requirements, capabilities and limitations for Military Occupational Specialties.

SUPPORTING RECOMMENDATIONS

7. Findings of the scanning/integration mechanism should serve as input into requirements definition for human resources RDT&E

The Army Science Board could have a monitoring role in such input.
8. Focus, in addition, on the utility of such technologies for Reserve and National Guard readiness needs.
9. Focus, also, on maintenance and repair skill requirements that could be significantly improved through such technologies.
10. Human technology R&D programs should be under the sponsorship of the DCSPER and under the direction of Army Research Institute, Medical R & D Command, Human Engineering Laboratory independently of each other, or jointly, as appropriate.
11. The Army should not pursue 6.1 human technology R&D programs in-house within Army laboratories or other organizations.
12. Continue to identify off-the-shelf commercial methodologies and tools which can be modified for Army use and evaluated for use in the field.

IN CONCLUSION

A major challenge exists today, and will exist to a far greater extent in the future, for the Army to obtain optimal performance from its human resources. The potential payoffs from emerging human technologies reside in enhanced selection and MOS designation, initial training and skill retention, unit training and cohesion, job effectiveness, command climate and unit atmosphere, quality of leadership, physical fitness and soldier-machine interface.

It is therefore concluded that the Army should continue to evaluate and test, where practical results have a high probability, an array of human technologies.

To do so, the Army needs to organize and integrate the process of exploring, evaluating, testing and adapting such technologies.

Finally, exercise caution in these efforts remembering to allow room for freshness and innovation while simultaneously maintaining a solid scientific footing for introduction of the results of the RDT&E programs.

Phillip Sidwell
Chairman
Ad Hoc Study Group



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL
WASHINGTON, DC 20310

REPLY TO
ATTENTION OF

DAPE-HRI

5 NOV 1982

MEMORANDUM FOR PRINCIPAL DEPUTY ASSISTANT SECRETARY OF THE ARMY
(RESEARCH, DEVELOPMENT, AND ACQUISITION)

SUBJECT: ASB Fall 1982 General Membership Meeting

1. Thank you for your invitation to attend the ASB Fall 1982 General Membership Meeting. I will be unable to attend the meeting but will be represented by MG Mitchell.
2. At the Fall Meeting I ask that you consider the following potential areas for study in the upcoming year:
 - o Equipment development process - investigate how we design systems and whether we consider the number and skills of mental category IV soldiers that will be available to operate the equipment under mobilization.
 - o Training (including simulation) - how can we design better training methods and procedures with a special emphasis on the "field mode" and small units away from institutions.
 - o Leadership development - how can we identify and select better leaders? How can we train better leaders? How to educate better leaders?
 - o Cohesive units - we know that cohesive units train better, fight better, and survive better. How do we maximize the cohesive ingredients in our combat units.
 - o Emerging Concepts - can areas of emerging, non-traditional psychology offer the American soldier an advantage over his adversary. These include such areas as: accelerated learning, inferential focus, pre-visualization, psycho and bio kinetics, remote viewing, biophysical stress prevention, etc. Do any of these areas hold potential value to the Army?
3. Additionally, I have inclosed an expanded list of topics for consideration by the Army Science Board.
4. Your continued interest and attention to the Army's challenges in the people arena is most welcome.

1 Incl
as

M. R. Thurman
M. R. THURMAN
Lieutenant General, GS
Deputy Chief of Staff
for Personnel

TOPICS FOR CONSIDERATION BY

ARMY SCIENCE BOARD

PM Incentives

The PMs are currently "graded" on the time and money they spend to field a system. Issues of the usability of the system (Can it be used by the intended user population? Is the manning system able to provide the target user population?) are not explicit elements in their performance appraisals. How can we provide proper incentives to PMs for effective consideration of MPT issues?

Investment Strategy

The time and budget drivers of materiel acquisition frequently victimize manpower, personnel and training (MPT) considerations--"We don't have time to consider that - it would take too long to get the data and we'll have to go with a SWAG," "We are short dollars, need to reduce the attentions to MPT and get hardware produced." We need a fresh look at our acquisition and investment strategy - How do we make rational trade-offs among (a) 5 good systems in 5 years vs. (b) 10 adequate systems in 6 years vs. (c) 10 marginal systems in 4 years vs., etc.

People Analog to ILS

The Integrated Logistics System (ILS) includes 2 "people" elements among the 12 elements to be considered in system development. Would we improve our systems if we were to create a "people analog" to the ILS to support and guide the system development process?

The Distribution of Personnel Among the Services with Reference to Quality Requirements

It has long been noted that the distribution of personnel entering military service has been unequal among the services with respect to the quality of such personnel as measured by tests taken at time of induction. This is not to suggest that the distribution of Cat III personnel, for instance, should be of equal proportion in each of the services. It is to suggest that the Army, for one, should justify its aptitude requests based on an analysis of the quality of personnel required to operate and maintain emerging systems and to otherwise run the Army.

A Strategy for Meeting Future Retraining Requirements Resulting from the Introduction of New Technologies

Modern technology is permitting the design and production of more effective, more efficient Army systems. The introduction of technology-based equipment will continue to have an impact on the soldiers who must use them. New MOS' will be required to support their operation and maintenance. These new equipments, in many cases, will take over functions previously performed by the

soldiers. Current jobs will therefore have to be restructured to reflect new job requirements. To meet the challenge posed by the introduction of new, technology-based equipment, the Army must develop a comprehensive strategy for the retraining of the career soldier base — both Active Army and Reserve Component.

Measuring and Enhancing Productivity in Military Organizations

Technology is available, with new technologies emerging every day, that can be used to increase the productivity of military organizations, including the performance of units in the field. However, the critical problem is: How should these technologies be used to lead to the greatest increases in productivity? The answer to this question is complex. First, there is a need to be able to assess (i.e., measure) the current state of affairs. Then, it is necessary to determine how and where what technologies should be employed to increase productivity. Finally, it will be necessary to measure the changes in organizational performance that result from the introduction of productivity-increasing technological assists.

Quality of Work Life Vis-a-vis Combat Effectiveness

With constrained resources, there inevitably is a trade-off between the satisfaction of quality of life needs and resource allocations to enhance combat effectiveness. Factors to be considered in making such a trade-off are:

- o The relationship between quality of life and combat effectiveness -- the trade-off may not be simple.
- o The causal mechanisms linking quality of life factors and combat effectiveness. The direction of causality may be complex.
- o The degree to which quality of life, especially quality of work life, can be equitably balanced across branches. For example, quality of life may be far easier to maintain at a high level at fixed CONUS installations for soldiers in combat service support branches than at OCONUS installations for soldiers in the combat arms. Equity concerns should enter the trade-off analyses.

Such a study would examine these and other factors to determine methodology for trade-off analysis and heuristics for resource allocations.

How to Widen Manpower Base

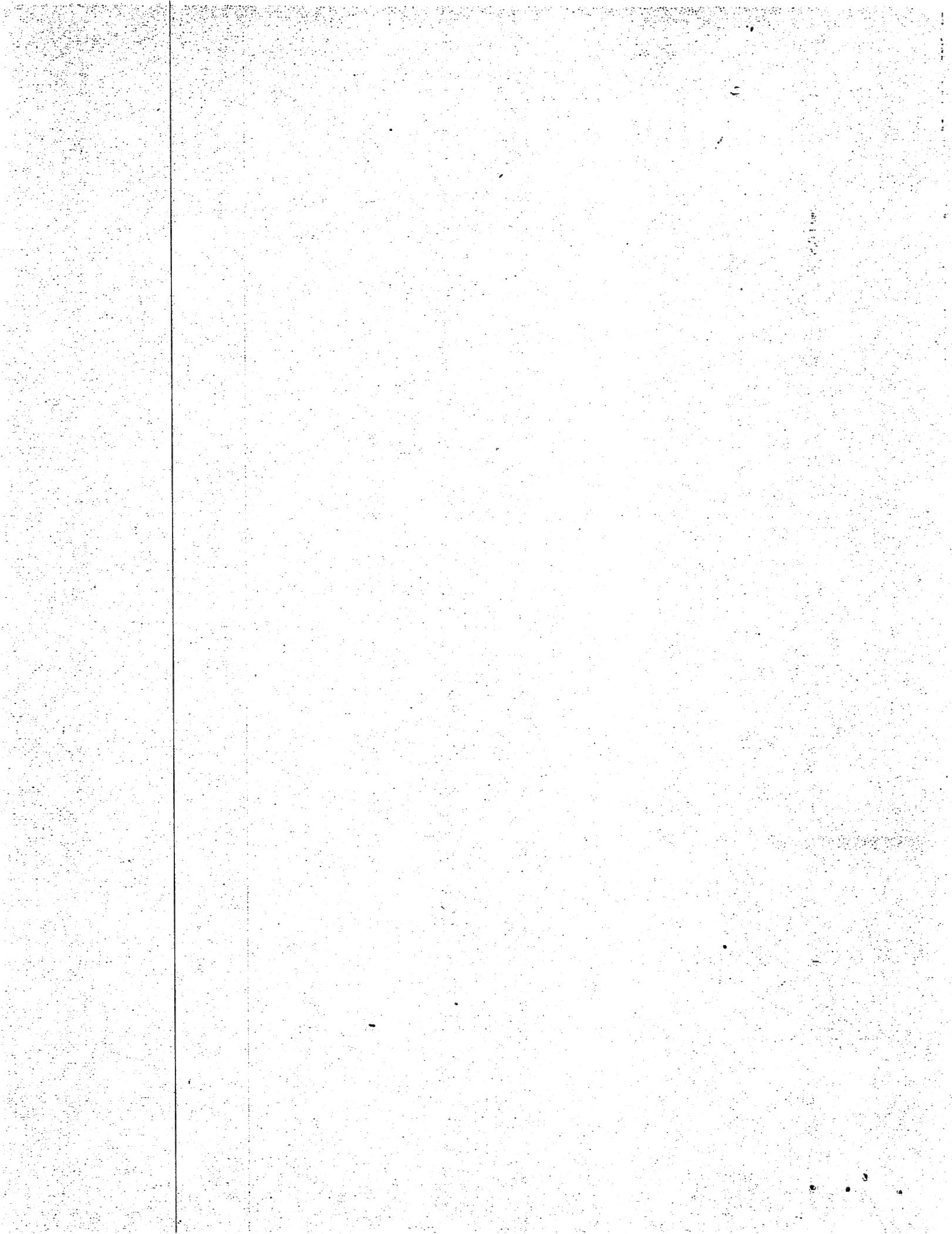
We need to work at guiding principles for expanding the manpower base. The whole question of lateral entry, proper mix between quality and quantity and the women in the force issues needs to be explored.

MEMORANDUM FOR DR. SIDWELL, CHAIRMAN, ARMY SCIENCE BOARD
SUBGROUP ON HUMAN CAPABILITIES AND RESOURCES

SUBJECT: Army Science Board Report on "Emerging Concepts
in Human Technology"

Only two meetings were held focusing on the "Emerging Concepts." These were:

- a. 18 April 1983 briefing by INSCOM on their study "Beyond Excellence" held in Room 2E687A, Pentagon. This was primarily a briefing for MG Mitchell, Director of Human Resources Development, ODCSPER. Present were other representatives of ODCSPER, ARI, and DARCOM in addition to selected members of the Army Science Board.
- b. The session at the Monroe Institute 23-26 May 1983.



SUGGESTIVE ACCELERATED
LEARNING AND TEACHING TECHNIQUE (SALTT)

KAMAN TEMPO CORPORATION

OVERVIEW

SALTT is a proven method which has broad potential application in US Army Training. It will significantly reduce training time, improve memory of material learned and introduce behavioral changes that positively effect soldier performance: self-esteem, self-confidence and mental discipline. In sum, the SALTT trained soldier will be better equipped to man a technologically changed Army and function and survive in the Air Land Battlefield environment.

DESCRIPTION

The SALTT technique uses a number of psychological, visual and aural components to increase learning rate and retention. The technique employs a combination of physical relaxation exercises, mental concentration, guided imagery and suggestive principles. These are designed to strengthen the ego and to expand learning and memory capabilities by interplay of conscious and subconscious perceptions which result in multiple anchoring in memory and unusual activation of learning potential.

At the present stage of development, the primary goal of SALTT is to facilitate learning and retention of cognitive material. This is accomplished by carefully orchestrating all the factors in a classroom from the original suggestion that the student can learn phenomenal amounts of material to non-stressful testing of material learned. SALTT is a classroom instructional technology composed of a number of elements very familiar to the professional trainer: relaxation techniques, music therapy, and spaced repetition. Its unusual success derives from proper use of these and other techniques by highly competent instructors.

**SPECIFIC BEHAVIORAL/
PSYCHOLOGICAL CHANGES
PRODUCED**

The most dynamic result produced by this performance oriented learning is that most students will prove to themselves that they have learned a far greater amount of material per unit of time with a greater amount of pleasure than they have ever previously done. This realization causes a "snowball" effect and greater accomplishments are achieved in subsequent sessions until a high sustained learning rate is maintained.

The behavioral and psychological changes that result from this success are varied and both short and long-ranged. To some degree the recognized success in one

area would be expected to spillover and transfer into other areas. This would be particularly so if a lack of self-esteem was an inhibiting factor in accomplishment of a particular undertaking. Because the same SALTT used in the classroom can be applied by an individual for his own learning purposes, it is impossible to predict all of the long range behavioral and psychological changes that may take place as the result of broad use of SALTT.

It is expected that a large percentage of students who are routinely involved in SALTT supported training will, over time, tend to become more self-directed, develop a higher degree of mental discipline, become more capable of stress control, show higher levels of self-esteem and self confidence, and report an increased frequency of intuitive insight. A longitudinal psychological study would be necessary to test this theory. If indeed, these behavioral and psychological changes take place, they would rival in importance the anticipated large savings in training time and increases in training effectiveness. Simply stated, SALTT trained soldiers would be developing attributes essential for functioning and surviving in the extremely hostile combat environment postulated for the integrated AirLand Battlefield.

To establish the evidence that these behavioral and psychological changes will be produced by applied SALTT, a test could be made comparing the psychological profile of a current Army group that already embodies these attributes (e.g., Airborne Ranger Companies and Battalions) with the psychological profiles of a special group of recruits after they received basic training via SALTT. To be examined are the trends in the recruit group's entry psychological tests to post SALTT-training psychological tests to determine movement in the direction of psychological attributes held by the control group.

NATURE OF EVIDENCE TO SUPPORT CLAIMS

There is a growing body of controlled experiments that support the claims of accelerated training. It has been evaluated in several field experiments overseas and in U.S. public school classrooms and the component elements evaluated in analytic laboratory studies with college students. An evaluation plan has been defined for potential US Army training applications.

TARGET POPULATION

SALTT has been successfully used over an age range of grade school children to college students for a variety of subject matter. Both sexes have successfully participated, but it is unknown whether one sex does better than the other with this technique. Nationality and ethnic group does not appear to be an important factor in successful SALTT application. The Soviet

Union reports using SALTT techniques at the Pushkin Institute teaching Russian to Soviet minorities. Available documentation states that after 60 days of intensive Russian language instruction, students are speaking and writing correctly with a 2500 word vocabulary.

The target audience for SALTT could be the entire US Army. Application could be in every classroom course. Currently there is no evidence of SALTT application, it must be validated in an appropriately designed program. A suitable test vehicle could be an inexpensive program to determine whether typing instruction via SALTT is superior in results to conventional typing instruction.

CHARACTERISTICS OF THE TECHNOLOGY

SALTT is not complex, but it must be mastered to be successful. A one week workshop can adequately cover the basic techniques. A minimum of three additional weeks of a practicum would be required before an instructor would feel confident in structuring and presenting material in a SALTT format. This assumes prior mastery of the subject matter to be presented.

The technique has application to classes of a limited size. Experience has shown that 30-35 students probably is the maximum size. Instructor interaction with each member of the class is important. Environmental considerations are also important for SALTT instruction success. While an elaborate classroom setup is not required, a sterile classroom is inimical to success with SALTT. Similar to current Army training, basic audio visual support is required. The classroom should be configured so that students can freely move around and participate in class play activities. Play is used here in a psychodrama sense. During part of the presentation there is a deliberate effort made to develop a child-like learning atmosphere. The objective is to get the student to be as open minded as he naturally was as a learning child.

FIT TO ARMY PROGRAMS AND GOALS

The SALTT is completely compatible with Army goals, functions, programs, organizational structure, and military environment. It is a humanistic teaching method that explicitly acknowledges individual worth and potential. It is calculated to maximize individual performance and capability. Whether it is in complete harmony with current Army culture and sociology can be debated. As previously noted, ultimately the SALTT trained soldier is expected to become an especially capable individual. To fully explicit an Army thus composed may require a very sophisticated leadership model.

COST/BENEFIT FACTORS

Cost/benefit factors in the training area are highly favorable to using the SALTT technique. Since the SALTT style is unique, instructors will have to adopt current lesson plans and material to the technique. This will be a required initial investment, but once accomplished, the savings in training time will quickly recoup it.

Cost/benefit factors in soldier behavioral and psychological changes also appear to be highly favorable. However, it must be realized that a more capable and in some way more demanding soldier will appear. The fact that future NCO leadership will develop from this same body of soldiers will ultimately take care of most problems caused by the changing nature of the soldiers. There is the possibility of a period during which the fellowship appears to outstrip available leadership in intellectual attainment and equanimity. Of course, current leaders can also be trained in those components of the SALTT that more adequately prepare them for the future AirLand Battlefield.

POTENTIAL APPLICATIONS

- New Equipment Training (NET) for soldier-machine interface.
- Psychomotor skill training.
- Language acquisition and proficiency.
- Computer literacy.

SUGGESTIVE ACCELERATED LEARNING AND TEACHING TECHNIQUES

A. Description. Suggestive Accelerated Learning and Teaching Technique (SALTT) is an approach to training that employs a combination of physical relaxation exercises, mental concentration, guided imagery, and suggestive principles, together with psychological, visual, and aural cues, with the intent of reducing training time and improving retention. The notion is that use of the various SALTT techniques permits content material to by-pass traditional emotional blockages and anti-suggestive barriers and go directly into long-term memory areas of the brain. In addition, to improving students' classroom performance, SALTT actively attempts to enhance self-esteem, self-confidence, and mental discipline. The various steps of a hypothetical SALTT lesson were demonstrated to workshop participants by actively engaging them in the process. For demonstration purposes the "lesson" topic was to teach computer literacy focused on ADA, the new DOD-standard computer language. SALTT instructors guided participants through a series of steps:

1. Physical relaxation exercises.
2. Mind calming, using guided imagery.
3. Restimulation, during which each "student" was asked to recall, silently, some significant, positive learning experience in the past.
4. Content phase, during which:
 - (a) Material was presented in a passive, lecture mode with appropriate visual aids and varied language.
 - (b) The "students" were subsequently asked to use the content material actively in playing a game.
5. Mind calming or release.

The instructors stressed the importance of incorporating all the demonstrated steps in a SALTT lesson to insure success of the method, though some variation in how any one of these steps is implemented can be tolerated. It was further stressed, however, that the presence or absence of Baroque music, which is used specifically during the passive phase of material presentation, has been shown to have the greatest impact on performance.

B. Prior/Current Applications. SALTT has been used most extensively and successfully in the teaching of foreign languages and less extensively in teaching science and math. To date the method has not been used to teach any psycho-motor skills, though the workshop instructors submit that the method could be adapted for teaching at least certain of these skills - including, for example, basic typing. Application of SALTT has been almost exclusively in academic settings. Most notably, from the standpoint of the Army Science Board Ad Hoc Panel, there are no data verifying the effectiveness of the SALTT method within the training arm of large

organizations - e.g., private industry, military.

C. Significant Commentary. In addition to experiencing the demonstration lesson, workshop participants discussed SALTT at some length with the instructors, trying to identify aspects of the method that might impact significantly the potential application of SALTT in Army classrooms. The following assessments by the instructors are of especial import to the Army:

1. SALTT instructors heavily emphasized the criticality of good, thorough training of instructors who plan to use SALTT. To quote from written materials provided at the workshop, "SALTT...must be mastered to be successful. A one-week workshop can adequately cover the basic techniques. A minimum of three additional weeks of practicum would be required before an instructor would feel confident instructing and presenting material in a SALTT format. This assumes prior mastery of the subject matter to be presented."

2. SALTT instructors acknowledge that the method relies on a number of techniques that are not the norm or expectation in the classroom. Even students need to get accustomed to this nontraditional approach. The training method not transparent to the student - and furthermore, is not intended to be transparent. In fact, it is intended that the students learn the critical steps of the teaching process so that they can employ the method at will to improve learning in other settings.

3. SALTT instructors stress that the total environment (culture) in which SALTT is used needs to be very supportive of the method itself. Further, the training classroom needs to be a "safe" environment. The student must be very trusting of the teacher - must not view the approach as making him vulnerable.

4. The "best" classroom environment for successful use of SALTT includes some living materials (e.g., plants), lack of clutter, visual aids matching written materials, blue/green classroom, indoors rather than outdoors.

5. SALTT relies on active interaction between students and instructor. Accordingly, instructors recommend applying the method in classes of limited size, probably a maximum of 30-35.

D. Potential Army Applications. As advertised in written material, "at the present stage of development, the primary goal of SALTT is to facilitate learning and retention of cognitive material." Based on this assessment and on the limited areas of application to date, any near-term application of SALTT within the Army should closely parallel previous nonmilitary applications - focusing on structured classroom environments and coursework that entails considerable rote learning/memory or recognition and recall. Language acquisition would be an obvious candidate. It would be difficult at this time to envision use of SALTT in training psycho-motor skills.

E. Evaluation. Clearly SALTT represents a significant departure from traditional training approaches used in Army classrooms. Consider, for example:

1. Rather than focusing on content material for 50 minutes at a time, SALTT focuses on content material for 15-20 minutes at a time - interspersing presentation of content with periods of physical relaxation, mind calming, and restimulation.

2. The use of music - specifically Baroque music - in the presentation of content material is unique to SALTT.

3. Traditional classroom instruction does not include active use of content material during the class, such as in playing a game.

4. SALTT actively attempts to impact self-esteem, self-confidence, and mental-discipline.

5. SALTT emphasizes the careful integration of various sensory modalities (touch, feel, smell, hear, see) in the development/selection of appropriate training aids and language.

6. Homework is discouraged other than on occasion and in a very relaxed environment.

An appropriate evaluation of the SALTT method for application to Army training revolves around the adaptability of the method to the Army environment and receptivity of the Army training culture to this decidedly nontraditional method. The question is not whether or not the SALTT method can beget improved classroom performance under specified conditions. Apparently improved performance has been demonstrated at least within limited topic areas that have been examined and in fairly well controlled settings. However, what has not been demonstrated adequately is to what degree the "best" environment for SALTT can be compromised without losing significant performance gains. Consider, for example, the possibility of outdoor, field instruction with something less than optimum SALTT instructors. Certainly the prospect of covering more training material in less time - and hence, at reduced cost - is extremely attractive. Once implemented successfully, a training method with such demonstrated success could mean significant dollar savings and improved readiness: a soldier becomes useful sooner and, hence, for a longer period of time. This has particular appeal when one considers the continuing need for retraining. However, the realization of these gains would require a significant change in Army mind set to permit effective use of the SALTT approach and its various nontraditional techniques.

F. Unanswered Questions.

1. Can SALTT be used with success within the structure/culture of large organizations - e.g., corporations or military?
2. Would the Army culture be receptive to a training approach that departs so significantly from traditional methods? - even within the same topic areas in which SALTT has demonstrated success?
3. How long would be required to train Army instructors in the basic

SALTT techniques and to develop specific training packages? In view of high instructor turbulence, turnover, is SALTT an approach that could be mastered in a practical amount of time? Or would development and presentation of customized training packages by a contractor SALTT team be required?

4. Can the techniques be adapted to an outdoor (i.e., field) environment?
5. Can the SALTT method be applied successfully to psycho-motor tasks?
6. Could existing Army course materials be readily adapted for use within a SALTT-based training course?
7. Where (in what settings/circumstances) could the Army most easily effect a supportive environment for the SALTT method? - e.g., in a basic training environment in which SALTT would become the standard for all those undergoing training and in a wide variety of areas?

COHESION TECHNOLOGY

A. Description. Cohesion Technology is an holistic approach to integrating physical, intellectual, psychological and values-based components of soldier behavior. It is designed to pull together the physical capabilities requirements and individual characteristics/traits/behaviors involved in sustained high performance. Central to achieving, maintaining and optimizing individual/crew/unit readiness and effectiveness is an holistic approach to originating, perpetuating and making believable the objectives, values, and mission of the unit to which each soldier belongs. It highlights the dimensions of individual excellence coupled with interdependent, mutual goals. Cohesion Technology brings together physical conditioning, skill acquisition, self-confidence development and team building and weaves them together rather than separated, disconnected programs and approaches used in BCT, AIT, unit training, deployment and replacement.

B. Potential Applications. This approach has possible applications to the combat arms and may fit with other types of units. If excellence at all levels and in all MOS's is a real goal of the Army, then individual competency, team proficiency and commitment to mission must be increased. There may be direct application to the active reserve and national guard as well.

C. Evaluation. The errors of inadequate attention to cohesion have increasingly been recognized at the highest levels of the Army. Some innovative integration of well accepted behavioral principles has been put into the design of this program. It was tested in prototype form within the 9th Infantry Division in several small test-beds and is currently being applied at the Leadership-Human Goal Test Bed at III Corps, Fort Hood, TX.

D. Unanswered Questions. What are the skill retention rates for individual MOS's using this approach versus standard methodologies? What improvements are maintained over time in crew/team/unit readiness and effectiveness? How would such an approach be applied in noncombatant MOS's and units? What are the training requirements for the trainers themselves? Are highly specialized officers and noncommissioned officers needed as trainers? How exportable is this approach? What effect could such an approach have upon retention rates, morale, disciplinary actions, wellness and recruiting? How does this program relate to the Army's physical and corporate fitness programs?



SPORTSMIND, Inc.

219 FIRST AVENUE SOUTH
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FT. HOOD HISTORY

In August of 1982, Sportsmind Inc. was invited by the G-1 of III Corps to sit and discuss with a group of interested parties what might be done to produce a program which would simultaneously improve mental and physical fitness. The observation was made that historically a soldier with a sound mind and body was superior to an enemy who was strong in only one of these areas. In addition, the demands of a highly technical modern army have required the training of a warrior unique in that he is asked to utilize his mind, body and spirit actively in the performance of his duties.

During October of that same year, a proposal was presented to produce the first generation of Combat Fitness Trainers. The term Combat Fitness was chosen because the point of the training, though it was transmitted via the normal P.T. time of a group, was to directly improve a units effectiveness in the execution of their mission. The P.T. activities were linked to the job function and organizational values of the unit. P.T. became a metaphor for the whole soldier's job.

November saw the start of training for 40 men from the 2nd Armored Division. The 2/5 Air Defense Attachment was chosen to be a test group to validate this program and after five intensive training weeks the new Combat Fitness Instructors went to work.

The 2/5 ADA is now in their fourth month of the new P.T. format and will continue in a testing mode through September 1983. At that time they will be compared to a control battalion to evaluate the effects on physical, psychological and organizational areas.

Currently a second group of Combat Fitness Instructors are being trained for the 1st Brigade of the Second Armored Division. Many of the officers and senior NCO's of the "Tiger" Brigade are now at the midpoint of their classroom training and will graduate at the end of April 1983.


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COMBAT FITNESS

Combat Fitness is a Sportsmind program that was designed specifically for the U.S. Army. Based on the work we have done with athletes and teams, we found that there are three interlocking elements that a team must master if they are to perform at peak levels. These elements are physical fitness, mental fitness, and team cohesion. A well tuned body is of no use if the mind is not tuned. Similarly, a well trained mind is of no use if the body is not in shape. Peak Performance will remain unattainable to a group of physically and mentally fit individuals without team cohesion. These three elements are essential to peak performance and the foundations of our Combat Fitness Program.

Sportsmind believes that our greatest contribution can be made by training cadres of trainers to deliver the Combat Fitness Training Program. By training trainers we are able to transfer this technology to a considerable audience without excessive cost. In our training program, trainers are instructed in each of the three essential elements.

In the Physical Fitness segment, an instructor learns aerobic fitness, strength training, stretching routines, running techniques, nutrition, diet awareness and control, and much more. In the Mental Fitness segment, an instructor learns relaxation techniques, communication skills, visualization techniques, and motivational dynamics. During the Team Cohesion segment, an instructor will learn teaching and learning techniques, cohesion games and recreational activities, group motivational skills, rituals and ceremonies, leadership models, and the planning and implementation skills necessary to install the new program.

This program has been an overwhelming success because it recognizes that the Army of Excellence is built on the three part foundation of physical fitness, mental fitness, and team cohesion.

COMBAT FITNESS TESTIMONIALS

Dear Mr. Major,

The Sportsmind approach to combat fitness is outstanding. The leaders of the Tiger Brigade have profited personally and professionally through their participation in the "train the trainers" program which you developed and conducted for the Brigade. With our experience in this program we are ready to enrich and improve the fitness training provided to the 2500 soldiers of the Tiger Brigade. I commend your team for its outstanding work and enthusiastic performance.

Sincerely,

PHILIP H. MALLORY, COL, AR Commanding

"Sportsmind Testimonial"

.Team Building

Discipline and confidence is much greater throughout the units.

Goals are easier to achieve.

Developes Junior NCO leadership.

Stimulates free time participation in fitness oriented activities.

Soldiers are closer to their leaders.

.Measured Results

Two Sportsmind Battalions finished 1 and 2 in the Division sponsored 10k run.

Through education, helps alcohol/overweight programs

This Battalion had 27% of unit participate in 10k run - 100% finished. High for the Division.

MAJOR GRIFFON, 2/5 ADA

As an Over Forty Command Sergeant Major, I was amazed at the material presented and especially new technique to make physical training interesting for today's soldier and at the same time raising the standards of the physical training program. I believe that fitness is the result of dedicated training of mind and body. The program that I have completed with Sportsmind caters to both mind and body. You integrated mental and physical qualities to help people perform at their peak capabilities. I have gained a better knowledge, skills, and clearer understanding of physical training.

LAWRENCE G. HOLLY, CSM, USA, 1st Tiger Brigade

The Sportsmind program significantly contributed to the enhancement of morale and esprit de corps in this Battalion during the last four months.

In the last, short four months this Battalion has clearly seen and demonstrated that Sportsmind can be a firm foundation on which to build that soldier for tomorrow.

NAMAN R. CARTER, CSM, USA, 2d Bn, 5th ADA, 2 AD

CONCENTRIX

"CONCENTRIX" designates a specific definition and procedure for training what is commonly called concentration and the physical performance which depends upon concentration. CONCENTRIX is a process used to acquire, improve and sustain individual skills in concentrating on a specific target at the correct time, for the correct duration, while maximizing hand-eye coordination, balance, body control, sensory skills, and visualization skills. CONCENTRIX training does not require special equipment or lengthy training periods.

CONCENTRIX training can be accomplished in almost any environment without need of specialized equipment. The exercises can be tailored to meet or emphasize any part of the basic CONCENTRIX program in accordance with a specific skill, e.g., marksmanship training for any weapon system. No formal change in organizational structure or significant disruption of current training methodologies is necessary.

In a world of increasing technological complexity and declining human resources, it is imperative that education and training break out of its traditional mold, and seek more efficient ways to develop human capabilities. For that worthy endeavor, CONCENTRIX is a good candidate.

CONCENTRIX

Dr. Raymond E. Reilly

OVERVIEW

A training process that develops basic skills in concentration, visual information accessing, balance, coordination, energy control, temporal and spatial awareness and integration to provide attention on target and centering on total relationship to the target.

DESCRIPTION

Many of the Army's current equipment/weapon systems, and those scheduled for introduction into the force, represent an ascending level of both sophistication and complexity. These technological advances and the high intensity demands of modern war, with its need for maximizing soldier capabilities and willingness to correctly use the equipment provided, necessitate a training program that improves concentration skills, reduces training time, increases individual confidence, and improves performance consistency. Concentrix training is a way to meet these goals.

"Concentrix" is a word created to designate a specific definition and procedure for training what is commonly called "concentration" and the physical performance which depends upon concentration. The word was created to suggest the concentric rings of a bull's-eye target and the visual skills associated with the target's use. In concentrix jargon, "target" is used in a generic sense to refer to any object of attention, be it internal or external.

Concentrix is a process used to acquire, improve, and sustain individual skills in concentrating on a specific target at the correct time, for the correct duration, while maximizing hand-eye coordination, balance, body control, sensory skills, and visualization skills. Concentrix training does not require special equipment or lengthy training periods.

Concentrix meets the soldier's need for significantly increased concentration skills in operating complex equipment in an intense combat environment. Concentrix is an efficient, non-specialized-equipment-dependent means to provide improvement in these concentration skills that impact on the soldier's duties which require significant levels of physical activity. The specific physical activities include marksmanship training for all weapons systems; target detection training; increased soldier capabilities to move for long distances with a significant reduction in soldier fatigue; improved soldier intelligence gathering abilities; and, a significant improvement in basic soldiering skills. In addition concentrix should be a

valuable tool in improving soldier cognitive skills, such as reduction of trial and error learning, reading retention; programmed learning programs; map reading; some communication MOS which require that high skill levels of attention for long periods of time by the equipment operators; and fire direction center personnel. Concentrix training is applicable to military personnel at any grade level in combat, combat support, and combat service support units.

Concentrix training can be accomplished in almost any environment without need of specialized equipment. The exercises can be tailored to meet or emphasize any part of the basic concentrix program in accordance with a specific skill - improvement need, e.g., marksmanship training for any weapons system. No formal change in organizational structure or significant disruption of current training methodologies is necessary.

**SPECIFIC BEHAVIORAL,
SUBJECTIVE,
PHYSIOLOGICAL CHANGES
PRODUCES**

OBSERVED RESULTS:

- Builds skills in learning how to learn.
- Improves measurable accuracy of any physical activity.
- Improves consistency in performance and reduces frequency and severity of performance slumps.
- Improves ability to plan for and set performance goals, program results and analyze outcomes.
- Increases efficiency of performance strategies and attainment of outcomes.

APPLICATION:

- Improved target search, detection recognition and classification.
- Improved analysis of target distance, direction and movement rate.
- Improved weapon/ammunition selection.
- Improved target/on system integration and communication.
- Improved alignment of weapon with platform and fire control.
- Improved observation and appraisal of effects.

NATURE OF EVIDENCE TO SUPPORT CLAIMS

Climinal/observational appraisals using over 500 participants over a five year period.

- Number of cases: 500+
- Methodology: Basic and Applied Integrated Training Strategy.
- Negative Cases: None Reported.

DEFINED/REPORTED CONCLUSIONS:

- Results vary with desired outcomes and techniques used.
- A viable strategy for aiding performance accuracy and consistency.
- Assists in minimizing performance degradation.
- Training/Observation: Professional athletes, students, and managerial/sales personnel ages 5 to 40 with emphasis on males ages 15 to 25.

APPLICATION:

- Males and females.
- Individual weapon marksmanship
- Crew served/anti-tank weapon gunnery
- Observers
- Requires no special equipment. Can use locally fabricated training aids. Trainers can be trained in + 20 hours to deliver training in each specific area. Training can be conducted in groups of up to 12 people.
- Mastery of each process can be attained in + 8 hours plus reinforcement on a periodic basis.
- Outcome improvements enhance selfreinforcement without trainer dependence.

FIT TO ARMY PROGRAMS

- Can supplement weapon system New Equipment Training (NET) programs.
- Can supplement/replace selected training techniques for existing equipment.
- Can supplement IET/Unit individual training programs.

**FIT TO ARMY STRUCTURE/
ORG**

- Applicable at all levels of organization depending on specific areas of training used with no change in organization or structure required.
- Technology can be transferred to trainers (NCO's/EM) for unit/training center use.

**FIT TO ARMY SOCIAL
STRUCTURE**

- Attitudes and belief held by traditional trainers may be affected. A demonstration process is needed to ensure acceptance.

**FIT TO LARGER
SOCIOPOLITICAL
ENVIRONMENT**

- No anticipated impact.

COST-BENEFIT FACTORS

Concentrix can increase the combat readiness of the force by:

- Improved individual performance of weapon and observer related tasks.
- Improved planning, goal setting and analysis.
- Initial emphasis for improvement could be focused on NET for high technology weapon systems.
- Short term retention and long term recruiting objectives should be positively affected.
- Implications for force multiplication are highly positive. Low resource requirements for support enhances the attractiveness of this technology.
- Cost of implementation is negligible.
- No potential pitfalls in application are evident.
- No negative consequences requiring damage limiting strategies are foreseen.

**POTENTIAL
APPLICATIONS**

- IET Basic Marksmanship Training
- Anti-Armor Unit Tests
- NET for new weapon system-soldier-machine interface.

NEW PATTERNS OF INFLUENCE/HIGH PERFORMANCE PROGRAMMING

New Patterns of Influence/High Performance Programming. Like a number of OE applications, NPI/HPD is a performance oriented management technique. As such this technique must be evaluated empirically for widespread application. Little empirical data exists with which to assess the effectiveness.

A. The commercial core package is a derivative of Neuro-Linguist Programming (NLP). The basic NLP model involves reducing difference between individuals by identifying preferred modalities of others and matching them, and/or by leading others into a preferred match. This includes techniques for rapport building among individuals with the purpose of influencing people/teams/organizations with or without their knowledge.

B. The Military Developed Application is a strategy for achieving excellence in teams/organizations called High Performance Programming (APP). The basic HPP model involves nested frames of reference in which an organization progresses from being reactive to being responsive, proactive and high performing. The leader moves his organization through these frames of reference by programming appropriate values and outcomes with communications tools; one of these tools is New Patterns of Influence (NPI) which serves as an ethical context for application of another tool (NLP).

C. NPI/HPP has been offered in both commercial and Army in-house leader development workshops. To date, over 100 general officers and SES have taken the workshop, with a significant number of these providing extremely positive endorsement.

D. Potential Users/Applications of Technologies in the Army

1. General Officers/SES
2. Battalion Commanders and above.
3. Student Officers (USMA/ROTC/OCS)
4. Selected Personnel (Sgt. Maj. Academy, Technical Specialist/W.O.)

HIGH PERFORMANCE PROGRAMMING

Mr. Robert Klaus and Dr. Linda Nelson

OVERVIEW

An enhanced model of Army leadership which shows what leaders will need to know and do in the future. When combined with the "New Patterns of Influence" workshop, includes training in powerful communications techniques using Neuro-Linguistic Programming (NLP).

DESCRIPTION

High Performance Programming (HPP) is an advanced cognitive model for leaders who want to unleash the spirit and productivity of the people in their organizations. The HPP model shows how individual leaders and their units can progress from "reactive" levels of functioning to higher levels of "responsive", "proactive" and "high performing." This model is supported by a demonstration of how one can determine ones own typical decision making strategy and increase ones effectiveness in influencing self and systems development through applications of Neuro-Linguistic Programming.

SPECIFIC BEHAVIORAL, SUBJECTIVE, PHYSIOLOGICAL CHANGES PRODUCED

- Enriches the thinking and effectiveness of Army leaders who want to gain high performance from themselves, their peers, subordinates, superiors, and their organizations.
- Provides a useful diagnostic framework for assessing current performance levels as well as a road map for improvement.
- Provides a "hard science" of leadership and communication through application of Neuro-Linguistic Programming (NLP) skills.
- Provides an ethical foundation for use of powerful influence skills.

NATURE OF EVIDENCE TO SUPPORT CLAIMS

- Reported observations of 31 Army General Officer and Senior Executive Service civilian participants.

SCIENTIFIC, CLINICAL, OBSERVATIONAL STUDIES

- Number of cases: Over 100.
- Methodology: Training seminar/workshop.
- Negative cases: None reported.

DEFINED/REPORTED CONCLUSIONS:

- Provides increased awareness of outcomes of individual leadership behavior.

- Provides an ability for self-diagnosis of communication effectiveness.
- Enhances ability of leaders to program high performance in subordinates and organizations.
- Provides framework for assessment of individual and organizational behavior toward producing desired results.

TARGET POPULATION

- Training Observation: Senior leaders/managers.

APPLICATION:

- Command groups.
- Senior leaders.
- Planners/planning staffs.
- Combat leaders.

CHARACTERISTICS OF THE TECHNOLOGY

- May be conducted indoors or outdoors with groups up to 18. Not equipment dependent, may use locally available training aids. May use two or more trainers.
- Mastery of basic skills can be achieved in 30 hours.
- Maintenance/retention can be self-generated with practice.

FIT TO ARMY PROGRAMS

- Can supplement leadership training for Officer/Senior NCO development in schools and units.
- Ideal for command transition workshops.

FIT TO ARMY STRUCTURE/ORGANIZATION

- Adaptable to unit use at battalion level and above.
- Technology can be transferred to specially trained OESO's for "in-house" training. Trainers require a minimum of 20 days skill training.

FIT TO ARMY SOCIAL STRUCTURE

- No anticipated problems.

FIT TO LARGER SOCIO-POLITICAL ENVIRONMENT

- No significant problems identified.
- Army leadership in development of this technology has potential for adaptation in civilian organizations.

COST-BENEFIT FACTORS

- High Performance Programming can increase the combat readiness of the force by:
- Increased commitment to organizational objectives at all levels.
- Increased cohesion through clarity of leader directed purpose and direction.
- Favorable retention and recruiting should result from improved leadership.
- Low cost of this training makes it highly attractive for wide application.

POTENTIAL APPLICATIONS

- "Cellular" Command Post.
- Special trainings for Division and Brigade level command groups.
- All Source Intelligence Centers and "Fusion Centers."
- Special training Army War College students and BG designees.
- Stability alternatives for high performance functional assessment over time (e.g., Force Modernization Coordination and Management Activities).

HEMI-SYNC

A. Purpose. The purpose of the Hemi-Sync presentations and exposures was to demonstrate possible applications of the Hemi-Sync technique to Military problems.

B. Material Presented. Items experienced included (a) a sleep tape, (b) a wake-up conditioning tape, (c) a concentration tape, and (d) a retain/recall information tape. Verbal discussion of the technique was covered briefly on 25 May 1983.

C. Hemi-Sync Concepts.

1. The Hemi-Sync technique involves presenting two tones slightly differing in frequency to separate ears via stereo headphones. The subject perceives a difference, on beat frequency in the range of 3-5 Hz, which is generated in the brain itself in a way not understood by scientists working in this area. To this point, the process is accepted by the scientific community.

2. Additional hypotheses presented by Robert Monroe are that:

(a) This beat frequency synchronously "drives" the electrical activity of both right and left brain hemispheres, as observed with electroencephalographic measurements, in step with the beat frequency. (This could not be observed because the research work area was being remodeled but we believe this claim could be easily verified at another visit).

(b) The claim was made that the electrical effect stimulated the brain stem to induce certain changes within its claimed biologic sphere of influence, i.e.:

- Cause sleep
- Reduce stress
- Cause wakefulness
- Increase concentration
- Recall, retention facilitate retention/recall of information
- Decrease pain if present
- Increase speed of healing following surgery or injury

D. Military Applications. Potential military applications are obvious for each of the claims listed above. Evaluation comments are given below:

1. Exposure to the sleep tape did appear to aid sleep induction and stress reduction.
2. Wakefulness effects were not convincingly demonstrated.

3. Concentration benefits were not convincingly demonstrated either during the workshop or in the study report distributed to participants of the use of the Fast Acquisition Skills Training tapes at the Defense Information School (DINFOS).

4. Medical claims and effects were not supported by scientifically acceptable studies, only testimonial type comments.

E. Unanswered Questions. Unanswered questions are in two general areas:

1. Is the hypothesis correct that the beat frequency synchronizes electrical activity in both hemispheres of the brain (thus "Hemi-Sync" as a name)?

2. Does this synchronized electrical activity stimulate the brain stem centers of sleep, wakefulness and other basic functions?

3. Are the claims for sleep induction, increased wakefulness or concentration and medical benefits correct?

HEMI-SYNCH

MONROE INSTITUTE OF APPLIED SCIENCES

OVERVIEW

A process using audio tapes which align brain wave synchronization using audio frequency patterns to achieve specific performance objectives.

DESCRIPTION

The Monroe Institute of Applied Science has developed a method and technique that offers much promise and potential for increased human performance. It can be utilized with relative ease, does not require years of intensive training, and is not limited to a narrow band of application.

This technology is called HEMI-SYNC, which is short for Hemispheric synchronization. The process uses pulsed sound frequencies to help create simultaneously an identical wave form in both brain hemispheres. The Institute was granted a patent in 1975 based upon the use of such sound pulses to induce a frequency following response (FFR) in the human brain. This simply means that when your ear hears a certain type of sound signal, it tends to respond or "resonate" with similar electrical signals in the brain. Knowing that various electrical brain waves are indicators of states of consciousness (such as awake or asleep), you thus can listen to a similar sound pattern and it will help you be in the desired state of awareness.

HEMI-SYNC takes the process an important additional step. Each ear sends its dominant nerve signal to the opposite brain hemisphere. By sending separate sound pulses to each ear (using headphones to isolate one ear from the other), the halves of the brain act in unison to "hear" a third signal, which is the difference between the two signals in each ear. For example, if you hear a sound of a frequency of 100 CPS in one ear and another signal of 125 in the other, the signal your brain will "generate" will be 25 CPS. It is never an actual sound, but it is an electrical signal that only can be created by both brain hemispheres acting and working together.

That's HEMI-SYNC. If the "25" signal (above) is one that produces a certain type of consciousness, then the whole brain - both hemispheres - is focused in an identical state of awareness at the same time. Most important, the condition can be changed at will by changing the sound pattern. It also can be learned and recreated from memory as the need arises.

The HEMI-SYNC process has been applied in many ways: for better sleep, stress-tension reduction, control of pain, accelerated learning, study and concentration, rapid psycho-therapy, enhanced creativity and problem solving.

**SPECIFIC BEHAVIORAL,
SUBJECTIVE, AND
PHYSYIOLOGICAL CHANGES
PRODUCED**

CLINICAL RESULTS:

- Single point attention focus.
- Increased use of memory patterns.
- Increased creative application.
- Improved muscular coordination.
- Additional memory capacity.
- Improved memory/retention of learned skills.
- Improved problem solving and decision making.

APPLICATION:

- Rapid language vocabulary learning.
- Decreased learning decay.
- Enhanced reading skills.
- Improved multi and single variable information processing.
- Stress management.

**NATURE OF EVIDENCE TO
SUPPORT CLAIMS**

Clinical/Observational studies using 4,823 experiments among test participants over a five year period.

**SCIENTIFIC, CLINICAL,
OBSERVATIONAL STUDIES**

- Number of cases: 1280
- Methodology: Experimental design.
- Negative cases: None required.

DEFINED/REPORTED CONCLUSIONS:

- Results vary with type signals used.
- Reintroduction of same signal evokes replication of original participant characteristics.

TARGET POPULATION

- Induced states can be learned and reestablished without original stimulus.
- Influence not pervasive. Can be rejected easily (ethical consideration).
- Test/observation: All with emphasis on high school performance age males with high school performance problems.

APPLICATION:

- Males and females.
- Language proficiency.
- Intelligence Analysis.
- Soldiers with reading problems.
- Soldiers requiring enhanced multivariable information processing (Combat Arms).
- Soldiers who can only practice skills periodically.
- Combat stress management in continuous operations.
- Initially, requires indoor facility or field shelter with electrical outlet. Uses portable machines/devices. Requires one on one trainer-participant relationship. One trainer can work with up to six participants simultaneously with six devices.
- Mastery of each process is outcome dependent.
- Maintenance/retention can be self/process generated without machine/trainer dependence.

FIT TO ARMY PROGRAMS

- Can replace/supplement selected BSEP phases and supplement IET/Unit Skill individual learning/training programs.

FIT TO ARMY STRUCTURE/ORGANIZATION

- Adaptable to unit use in individual learning centers at company, battalion and large unit/installation level with no significant change required other than quiet area.
- Technology can be transferred to educators, instructional technologists, trainers and behavioral science/psychiatric specialists for application in education centers, BSEP contract activities, medical facilities, Army schools, installations and units.

FIT TO ARMY SOCIAL STRUCTURE

- Attitudes and beliefs held by traditional educators and trainers may be affected. A demonstration/learning process is needed to insure adaptability.

FIT TO LARGER SOCIO-POLITICAL ENVIRONMENT

- General and specific acceptance and support may be dependent on demonstrated results and innovative application.
- Reaction from status quo oriented individuals and groups could be initially negative, particularly from those groups/individuals who view this technology as a "pop" or "fad" area with negative implications for "altered states of consciousness."

COST-BENEFIT FACTORS

- Hemispheric Synchronization can increase the combat readiness of the force by:
- Enhanced and more rapid learning of languages, analytical constructs, reading skills and variable information processing.
- Improving learning ability and awareness of soldiers.
- Providing soldiers and commanders with skills to offset stress in sustained combat operations.
- Improved retention of learned skills to reduce retraining costs in skill maintenance.
- Initial emphasis for improvement could be focused on foreign language training and acquisition of new skills to support new hardware technology.
- Implications for force generation and regeneration are highly positive. Low resource requirements for support enhances attractiveness of this technology.
- Cost of implementation of a selected basis is negligible. Cost of integration into full range of Army programs compares favorably with other strategies.
- No potential pitfalls in application are evident, providing trainer quality and individual reinforcement continuity are maintained.
- No negative consequences requiring damage limiting strategies are foreseen.

POTENTIAL APPLICATIONS

- New Equipment Training (NET) for new materiel systems soldier-machine interface.

- All current and programmed tests for soldiers with marginal/deficient reading/math skills.
- Anti-armor tests for multi-variable information processing by TOW/Dragon crews.
- Stress management, rest/sleep discipline in unit fitness training and combat.

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